Assessment of
Potential Non-Point Source Pollution
For the Millers River Watershed
In Massachusetts

Nonpoint Source Project Number 2000-03/604
Project Conducted: June 2000 to July 2002

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Submitted July 2002

"This project has been financed partially with Federal Funds from the Environmental Protection Agency (EPA) to the Massachusetts Department of Environmental Protection (the Department) under a s. 604(b) Water Quality Management Planning Grant. The contents do not necessarily reflect the views and policies of EPA or of the Department, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use."

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Executive Summary

With an increasing environmental awareness and less tolerance of pollution, citizens across the Commonwealth have become more involved in making decisions on local management of our Natural Resources. These motivated people are shaping environmental policies and programs in their communities statewide on a watershed basis. Currently, their movement is to ensure good water quality. The battle they face is to reduce one of the greatest threats to water quality, Nonpoint Source Pollution.

Non Point Source Pollution (NPSP) refers to widespread and commonly small sources of contamination, which cumulatively present a significant threat to water quality. Most NPSP can be directly related to non-sustainable land use. For example, residential and commercial land development is proceeding at a fast pace in many rural towns. As it occurs, the character of the rural areas is becoming increasingly urban. This urbanization is threatening environmental resources within a watershed[1].

During urbanization, pervious spaces including vegetated and open forested areas are converted to land uses that usually have increased areas of impervious surface, thereby possibly increasing runoff volumes and pollutant loadings. While urbanization may enhance the use of property under a wide range of environmental conditions, urbanization typically results in changes to the physical, chemical, and biological characteristics of a watershed.

Protection of the Commonwealth's surface water and groundwater from non-point source pollution is important for the maintenance of quality and quantity drinking water for its inhabitants. About half of Massachusetts' communities (166 of 351 cities and towns), comprising 60% of the Commonwealth's population, depend in whole or in part, on surface water supplies as their source for drinking water. In addition, water withdrawn from many wells in Massachusetts does not originate exclusively from groundwater aquifers, since in this state, rivers and aquifers are for the most part interconnected. Hydrologists have determined that wells can "pull water from adjacent streams from as far away as 1000 feet". The protection of the water quality of these streams and reservoirs is therefore important to the public and private drinking water supply of many towns. In fact, between 1967 and 1997, forty-seven Massachusetts communities have experienced temporary or permanent loss of public water supplies due to pollution.[2]

The Millers River Watershed Team, with the assistance of the Montachusett Regional Planning Commission and Franklin Regional Council of Governments, conducted a potential non point source pollution assessment to develop priorities for protecting water quality throughout the watershed . The assessment first provides an inventory of existing conditions, a description of the five-year cycle of the Massachusetts Watershed Initiative (MWI), and a summary of prior water quality studies organized through the efforts of the MWI and the Millers River Watershed Team. This project was conducted in the research and assessment phase of the cycle to:

1. Provide a base of information to guide future government and private actions to reduce nonpoint sources of pollution;
2. Present an environmental/land use assessment of the Millers River Watershed;
3. Identify potential nonpoint sources of pollution; and
4. Develop an action plan to address the remediation of nonpoint source problems and the prevention of future problems.

The inventory is a compilation of current land uses, trends in land use change, and potential pollution sources. Following identification of current nonpoint source pollution threats in the Millers River Watershed, recommendations were developed for reducing these potential nonpoint source pollution problems. These recommendations are to develop additional water supply protection from existing non-sustainable

[1] Schueler, T.R. 1987. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMP's. Metropolitan Washington Council of Governments, Washington D.C. Leopold, L.B. 1997.
[2] Rizzo Associates, 1991

land uses and possible future land uses. The plan is intended to be a "living" document that will be revised over time as projects are implemented and conditions change.

Project Overview

The Millers River Valley cuts through a hilly, relatively rural landscape. The steep gradient of the river led to its use as a source of power supporting numerous industries. The industrial development over time resulted in significant pollution problems in the main stem and in the Otter River. Over eighty-six percent of the land area in the watershed remains undeveloped and eleven percent is developed. Only twenty-five percent of the total acreage is protected, leaving over sixty percent susceptible to development. One of the best ways to protect water resources from pollution is to protect the surrounding uplands from the encroachment of development.

The assessment commenced in June of 2000. The first task was to develop a map of the land use with data from the MassGIS. Data was available for both 1985 and 1999, which permitted a comparison of land use changes in the fifteen year time frame. Next, the environmental characteristics of the watershed were inventoried from numerous prior reports by state agencies and watershed organizations, then mapped from data available from Mass GIS. An extensive data collection process yielded a significant volume of data on potential pollution sources, discharge permits, and regulatory protection. Regular participation on the MWI Watershed Team and surveys of local officials provided extensive information on both the practices and concerns of the local communities regarding their watershed.

In the Fall of 2000, two stream teams were organized to engage the local public in the assessment process and conduct stream bank assessments of the Otter River and the Tully River. The teams compiled their assessments following guidelines from the Adopt-A-Stream Program of the Massachusetts Department of Fisheries, Wildlife, and Environmental Law Enforcement (DFWELE) Riverways Program. The teams used the assessments to identify and report immediate problems to proper authorities, and prioritize short- and long-range mitigation work to be done.

Nonpoint sources of pollution are mainly attributed to land uses and activities that allow pollutants to settle on the ground, penetrate the soil, or be expelled into the air. One of the single most important conditions in assessing the impacts of nonpoint source pollution is the degree of land area that has been rendered impervious to rainwater. Areas where large percentages of the landscape have been rendered impervious exhibit considerably more rapid stormwater runoff and greater potential for flooding, especially if they lie in floodplain regions. The removal of trees and the grading of land can significantly alter surface water hydrology.

A primary objective of the report was to identify both the existing and the potential sources of nonpoint source pollution throughout the watershed. Much of the information on potential sources of pollution comes from databases maintained by federal, state, regional, and local agencies. Many of the addresses listed are from the datalayers of the MassGIS or from the files of the Environmental Protection Agency. These valuable sources of information should be maintained and updated as frequently as possible. Not all sites listed in the report are known contributors to the pollution problem. They are simply land uses that have the potential to contribute nonpoint source pollution due to the nature of the materials they store, use, or generate or to their treatment of the landscape. Since many of these sites are heavily regulated, they must file regular reports of their discharges and the impacts on water quality. These reports provide a useful source of information on the overall water quality over time.

The impacts of numerous land use practices throughout the past century are directly responsible for the water quality issues we face today. Land use decisions of the past were based upon practicality and the needs of the industries. Local controls on land use developed later, as the region grew economically and in population size, in an effort to manage compatibility of uses. Development of zoning controls and subdivision regulations was primarily driven by concerns for human safety and quality of life, as well as the needs of the community to ensure that new uses of land did not overburden the ability of the local government to manage the resulting infrastructure. Changes to these controls are slow in coming and require a two-thirds

majority vote of the local residents to pass, as well as certification from the Attorney General. A comparison of the local zoning controls reflects the history of growth and the level of awareness of environmental concerns in the watershed.

Conclusions and Recommendations

The report provides a useful compilation of the extensive information collected on the health of the watershed. It serves as a guide for future endeavors to educate the public and shape the future environmental quality of the region. The involvement of the Stream Teams is an integral component of the process in that the local residents, who know their environment, take ownership of the clean-up effort and develop a cohesive and continuing body of volunteers able to conduct many of the data collection and clean-up tasks that are needed. The stream Team actions are also a useful tool for the public education process.

Recommendations of the report include conducting investigative actions at specific locations to devise mitigation strategies, continuation and expansion of water quality monitoring programs, extensive scientific research to quantify the impacts of various sources of pollution, and making improvements to Zoning By-laws. This process would begin by educating local governments with model guidelines for zoning and general by-laws, subdivision control regulations and Board of Health Regulations.

In areas with greater amounts of impervious cover, treatment of NPS pollution should focus on stormwater management practices, elimination of chemical leaks, monitoring of industrial processes and education of the residential landowners. In agricultural areas, education of private landowners on methods to control discharges, best management practices for keeping livestock, and alternative agricultural techniques would guide the treatment of NPS pollution. Working forestry projects operating below the Department of Environmental Management threshold of 25,000 board feet should try to implement the Best Management Practices, and these practices should be enforced on projects that are required to file cutting plans with DEM.

Both the assessment process and the mitigation process are fluid and evolving, and should be monitored and revised over time as each issue is addressed. The Action Plan is a living document and could be developed more fully. An interactive mapping project can help the Millers River Watershed Tram to geographically visualize the steps to be taken, and to track the effectiveness of the actions over time.